

APPLICANT(S): Sreekumaran et al.  
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FILED: July 20, 2006  
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#### **REMARKS**

The present response is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application is respectfully requested.

Applicants assert that the present invention is new, non-obvious and useful. Prompt consideration and allowance of the claims is respectfully requested.

#### **Status of Claims**

Claims 1-6 are pending. Claims 5-6 have been withdrawn from consideration. Claims 1-4 have been rejected. No claims have been amended in this paper.

#### **Traverse of Restriction Requirement**

Applicants note that the Examiner asserted in the April 13, 2009 Office Action that the response to the restriction requirement was made without traverse. However, in the March 2, 2009 paper responding to the restriction/election requirement Applicants did traverse the restriction requirement.

#### **35 U.S.C. § 103 Rejections**

In the Office Action, the Examiner rejected claims 1 and 3 under 35 U.S.C. § 103(a), as being unpatentable over Heinig Jr. (U.S. Patent 6,758,345). Applicants respectfully traverse the rejection of claims 1 and 3 under Heinig Jr.

Applicants assert that Heinig Jr. does not teach or suggest a composition comprising gold/silver nanoparticles having a size up to 150 nm deposited on activated alumina and/or magnesia, as required by Applicants' independent claim 1.

Heinig Jr. describes depositing **silver ions** on activated alumina:

Once the carrier material is activated, catalytically active **silver ions** are deposited on the carrier material ... to form a treatment medium. The **silver ions** are deposited on the surfaces of the activated carrier material ... (Heinig Jr., Column 6, lines 32-40, emphasis added).

Thus, Heinig Jr. does not disclose a composition where gold/silver **nanoparticles** are deposited on an activated carrier material, as required by claim 1. Further, as known in the art, in order to transform silver ions to silver nanoparticles, there is a need for high temperature annealing, chemical or photochemical reduction steps after the loading of the silver ions onto the carrier material. Since no such steps are described in Heinig Jr., there is no conversion of the loaded silver ions to silver nanoparticles.

Heinig Jr. includes further evidence of this, in that Heinig Jr. describes ionic silver possibly forming colloids, though not referring to nanoparticles: “The improved catalytic reaction mechanism allows the silver ions to assume an ionic and/or colloidal form ...” (column 6, lines 19-20). Applicants stress that “colloidal silver ions” are different from “silver nanoparticles”.

Accordingly, in view of the above, Applicants respectfully assert that claim 1 is allowable in view of Heinig Jr.

In the Office Action, the Examiner rejected claims 1 and 3 under 35 U.S.C. § 103(a), as being unpatentable over Kamiya et al. (U.S. Patent 4,234,456, “Kamiya”). Applicants respectfully traverse the rejection of claims 1 and 3 under Kamiya.

Applicants assert that Kamiya does not teach or suggest a composition comprising gold/silver nanoparticles having a size up to 150 nm deposited on activated alumina and/or magnesia, as required by independent claim 1.

Kamiya describes a method of preparation of silver-alumina adsorbent, the loaded silver being in the form of silver nitrate, which is subjected to annealing at 100°C (see col. 2 l. 61 to col. 3 l. 19). Since silver nitrate’s melting point is 212°C and it decomposes at 440°C (according to the information provided in the CRC handbook), it cannot become nanoparticles by heating it to 100°C.

Further, according to Kamiya col. 4 ll. 5-8 (“... and silver as silver nitrate is supported on the alumina carrier ...”) and ll. 60-64 (“100 g of the silica gel carrier is placed in ... admixed with 16.4 g of silver nitrate/40cc of H<sub>2</sub>O, and then dried at about 100°C, whereby a silver-silica gel adsorbent is obtained.”), the adsorbent in Kamiya is silver ion-supported alumina/silica and not silver nanoparticles supported on alumina, claimed in Applicants’

claim 1. Additionally, Kamiya does not mention that the supported metallic silver is nanosized and the size is up to 150 nm; therefore, such nanoparticles cannot be assumed.

Accordingly, in view of the above, Applicants respectfully assert that claim 1 is allowable in view of Kamiya.

In the Office Action, the Examiner rejected claims 1-4 under 35 U.S.C. § 103(a), as being unpatentable over Yan (U.S. Patent 5,322,628).

Applicants respectfully traverse the rejection of claims 1-4 under Yan.

Applicants assert that Yan does not teach or suggest a composition comprising gold/silver nanoparticles having a size up to 150 nm deposited on activated alumina and/or magnesia, as required by Applicants' independent claim 1.

Yan discloses a method of loading silver and/or gold **ions** onto a porous surface, e.g., an alumina surface, and then reducing the ions to elemental silver/gold on the porous surface (see line 56 of col. 3 to line 16 of col. 4 and line 66 of col. 5 to line 57 of col. 6). The sizes and size ranges of the elemental silver/gold particles formed on the porous surface according to Yan are not mentioned (it is not even stated that the elemental particles are in nanodimensions); it cannot be assumed that they are nanoparticles, which is required according to claim 1 of the Applicant.

Further, according to Applicants' claim 1, silver and gold nanoparticles are prepared in advance, and only then are loaded onto the activated alumina, as required by the claim 1 language "comprising gold/silver nanoparticles...deposited on activated alumina and/or magnesia." See, for example, one embodiment described in Applicants' specification: "[t]he next step in the process involves incorporation of these nanoparticles on activated alumina or activated magnesia" (paragraph [0009] of the publication US 2007/0166224). Thus, even if it is assumed that Yan's method produced elemental particles in nanodimensions, the methodology employed by Yan for the preparation of the supported catalyst (gold or silver ions are first loaded on to the support and then reduced to elemental forms by various reducing agents such as hydrogen or hydrocarbon gases at elevated temperatures, 200-500 degrees C) is different from that of an embodiment of the claimed invention where pre-formed silver nanoparticles are directly loaded on to activated alumina.

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Accordingly, in view of the above, Applicants respectfully assert that claim 1 is allowable in view of Yan.

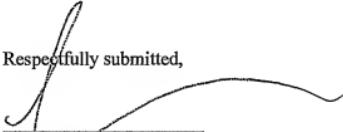
Accordingly, Applicants respectfully assert that independent claim 1 is allowable in view of any of Heinig Jr., Kamiya and Yan. Each of claims 2-4 depends from, directly or indirectly, claim 1, and therefore includes all the limitations of that claim. Therefore, Applicants respectfully assert that claims 2-4 are likewise allowable. Accordingly, Applicants respectfully request that the Examiner withdraw the rejections to claims 1-4.

#### Conclusion

In view of the foregoing amendments and remarks, Applicants assert that the pending claims are allowable. Their favorable reconsideration and allowance is respectfully requested.

Should the Examiner have any question or comment as to the form, content or entry of this Amendment, the Examiner is requested to contact the undersigned at the telephone number below. Similarly, if there are any further issues yet to be resolved to advance the prosecution of this application to issue, the Examiner is requested to telephone the undersigned counsel.

No fees are believed to be due in connection with this paper. However, if any such fees are due, please charge any fees associated with this paper to deposit account No. 50-3355.

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